GDS-2000 Series

200MHz/100MHz/60MHz Digital Storage Oscilloscope

FEATURES

- 200/100/60 MHz Bandwidth
- 2 or 4 Input Channels
- 1GSa/s Real-Time and 25GS/s Equivalent-Time Sampling
- 25k Points Record Length Maximum
- Large 5.6-in TFT Color Display
- 27 Automatic Measurements
- Three Math Functions Including "+" , "−" and " FFT "
- Multi-Language Support
- USB Host : Flash Drive Storage and Color Printout with Grayscale
- USB Device : PC Remote Control
- Battery Power Operation (Optional)
- GPIB & RS-232C Interface

GW INSTEK

Made to Measure

A Value-Priced DSO with High Performance & Reliability

Whether you are designing new products in the lab or giving lessons in the classroom or performing testing projects in the factory, you are fully aware that success starts with the right equipment. The GDS-2000 Series comes along with All-In-One design, including 1GSa/s sampling rate, 25k record length, 2 and 4 channel selection, TFT color LCD display, USB support on flash drive storage, color printout, and remote control, Battery power operation and all the powerful Auto-Measurement functions. With GDS-2000 Series digital storage oscilloscope, you could easily make your job done.

The GDS-2000 Series, carrying bandwidths of 200MHz, 100MHz and 60MHz and inputs of 2 and 4 channels, makes up a family of 6 members in total. The combination of 1GSa/s sampling rate (25GSa/s for ET sampling) and 25k points record length of GDS-2000 Series provides the highest value platform among all equivalent products available in the market today. The 27 Auto Measurement functions, FFT measurement, Advanced Triggering, 12 Division Horizontal Display, Time Clock, Frequency Counter, Go/NoGo, Multi-Language Screen Menu, On-Line Help, and Setup Sequence are all standard features of GDS-2000 Series.

The 1GSa/s sampling , the 2CH and 4CH selection with TFT color display , the USB mass storage and programmability , the RS-232C and USB interface included as standard features , and the battery power operation(optional) available for field applications all together make GDS-2000 Series a new standard for the main stream DSO market.

SELECTION GUIDE

MODEL	GDS-2062	GDS-2064	GDS-2102	GDS-2104	GDS-2202	GDS-2204
BANDWIDTH	60MHz	60MHz	100MHz	100MHz	200MHz	200MHz
CHANNELS	2	4	2	4	2	4
DISPLAY DEVICE	5.6" TFT Color LCD					
SAMPLE RATE	1GSa/s					
RECORD LENGTH	25k pts					
ADVANCED TRIGGER	Pulse Width ,TV Line , Event Delay , Time Delay					
VALUED FEATURE PLUS	Multi-Language , FFT , Go/NoGo , Auto Setup Sequence , 27 Auto-Measurements					
INTERFACE	USB Host / USB Device RS-232C Go/NoGo Output GPIB (opt.)					

ORDERING INFORMATION

GDS-2062 60MHz, 2-channel, Color LCD Display DSO
GDS-2064 60MHz, 4-channel, Color LCD Display DSO
GDS-2102 100MHz, 2-channel, Color LCD Display DSO
GDS-2104 100MHz, 4-channel, Color LCD Display DSO
GDS-2202 200MHz, 2-channel, Color LCD Display DSO
GDS-2204 200MHz, 4-channel, Color LCD Display DSO

OPTION

Opt. 01: GPIB Interface
Opt. 02: Battery Power Operation
(Factory installed, include additional DC Power & Battery charger circuits and Li-Ion Battery pack x 2)

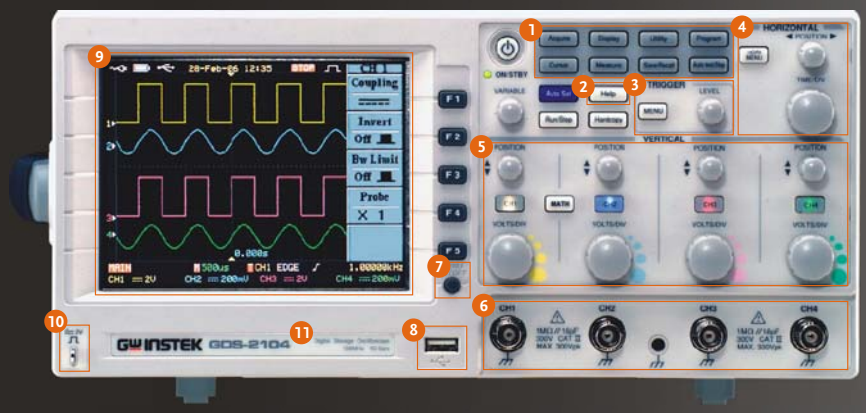
OPTIONAL ACCESSORIES

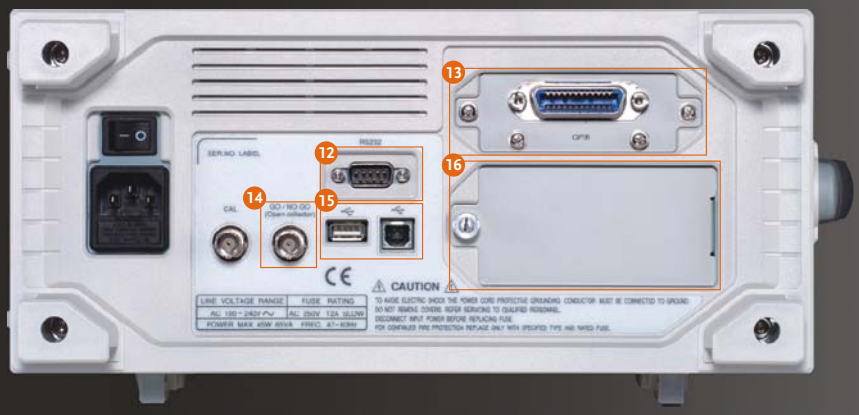
GTL-232: RS-232C Cable, 9-pin Female to 9-pin Female, Null Modem for Computer, 2000mm
GTL-242: USB Cable, USB 1.1 A-B TYPE CABLE, 4P, 1800mm
GSC-005: Soft Carrying Case
GRA-405: Rack Mounting, 19" 4U Type

STANDARD ACCESSORIES

Probe-GTP-060A:60MHz x10/x1 Switchable Passive Probe x 2 for GDS-2062
Probe-GTP-060A:60MHz x10/x1 Switchable Passive Probe x 4 for GDS-2064
Probe-GTP-100A:100MHz x10/x1 Switchable Passive Probe x 2 for GDS-2102
Probe-GTP-100A:100MHz x10/x1 Switchable Passive Probe x 4 for GDS-2104
Probe-GTP-250A:250MHz x10/x1 Switchable Passive Probe x 2 for GDS-2202
Probe-GTP-250A:250MHz x10/x1 Switchable Passive Probe x 4 for GDS-2204
User Manual
Power cord

PANEL INTRODUCTION





1. Function Keys
2. Online Help Function
3. Trigger System
4. Horizontal System
5. Vertical System
6. 4 Channal Inputs
7. 12 div Screen
8. USB Host
9. TFT Color LCD
10. Enhance CAL Signal Output
11. 1GSa/s Real Time Sample Rate & 25G Equivent Time Sample Rate
12. RS-232C
13. GPIB
14. Go/NoGo Output
15. USB Host/Device
16. Battery Power Operation (Li-Ion Battery)

FEATURES

- 200/100/60 MHz Bandwidth
- 2 or 4 Input Channels
- 1GSa/s Real-Time Sampling Rate
- Large 5.6-in TFT Color Display
- 25k Points Record Length Maximum
- 27 Automatic Measurements
- Advanced Triggering Including Edge, Pulse Width, Video, Time-Delay, and Event-Delay
- Three Math Functions Including " + " , " – " and " FFT "
- USB Host : Flash Drive Storage and Color Printout with Grayscale
- USB Device : PC Remote Control
- GPIB and RS-232C Interface
- Battery Power Operation (optional)
- Multi-Language Support
- Automatic Sequence & Go/NoGo Testing
- PC Remote Control Software for USB, RS-232C, and GPIB

200 MHz

GDS-2202/2204

100 MHz

GDS-2102/2104

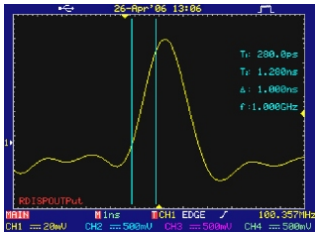
60 MHz

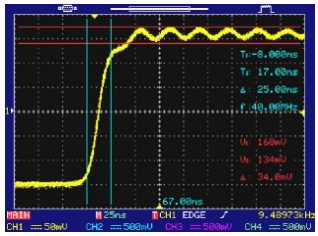
GDS-2062/2064

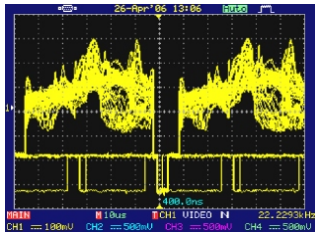
A. 4CH & 2CH SELECTION

4-channel models have joined the product lineup in addition to the traditional 2-channel models, doubling the spot range. All vertical scales of each channel carry a full bandwidth among the selection of 200MHz , 100MHz and 60MHz , depending on the model. The flexible solution of channel and bandwidth combination extends the GDS-2000 Series application range into various market sectors . The 4 channel applications for the tests of switching power supply and automotive are typical examples.

B. 1GSa/s REAL-TIME SAMPLING & 25GSa/s EQUIVALENT-TIME SAMPLING

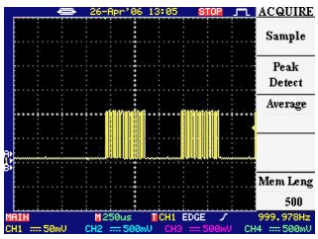


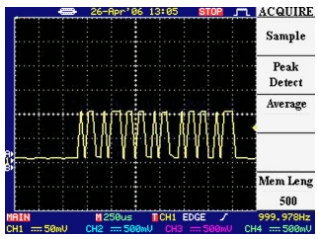


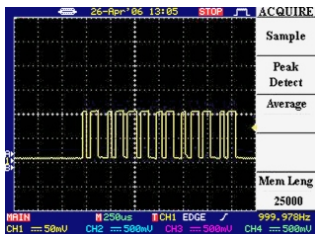


1GSa/s Real-Time Sampling allows you to deal with high frequency waveform capture in an accurate way. A higher sampling rate help acquire more waveform data in a short period of time. It is especially useful for the single-shot waveform capture and observation, as the more the waveform data can be acquired the better the waveform reconstruction can be done for a non-repetitive signal. When it comes to the repetitive waveform capture, the Equivalent-Time Sampling, however, becomes a better tool than Real-Time Sampling. By acquiring data from repetitive waveform cycles, the ET Sampling Technology accurately reconstructs the waveform at the resolution of only 40ps. GDS-2000 Series performs 25GSa/s sampling rate for the repetitive waveform acquisition and reconstruction besides its Real-Time Sampling capability at 1GSa/s rate.

C. 25000 POINTS OF WAVEFORM MEMORY

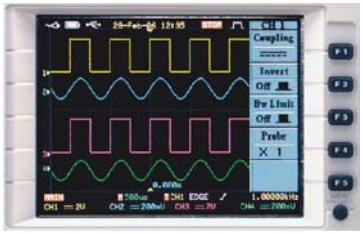


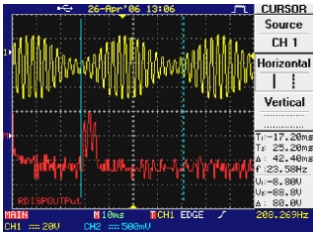


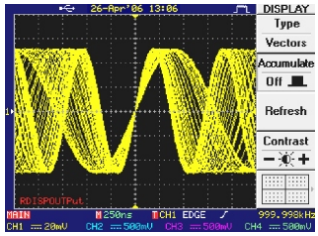


Longer memory helps the waveform acquisition system get more data in a certain period of time. The 25k memory length of GDS-2000 Series lets users view more signal details on the screen. The above left figure shows a serial digital signal transferred in a system. When using a short memory of 500 points , the DSO displays only a very rough and distorted waveform for this signal due to the inadequate details being captured (above center figure). When using 25k point memory, GDS-2000 Series captures and rebuilds the signal waveform in an accurate way (above right figure).

D. TFT COLOR LCD DISPLAY

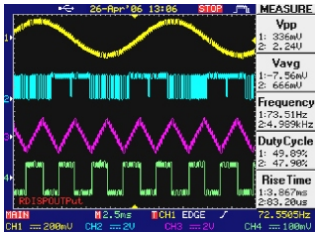


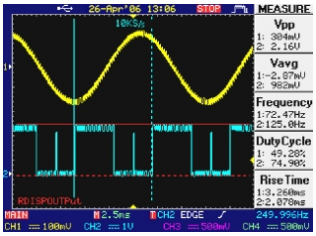


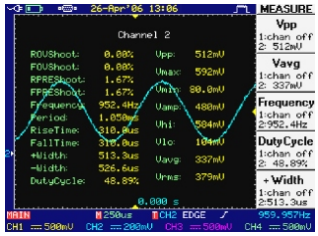


In order to guarantee a crisp and clear view in any situation , GDS-2000 Series adopts a TFT Color LCD display. With faster frame update rate compared to STN type of display, TFT panel reduces the flicker and gives a smooth signal view. In addition, the 45 degrees wide view angle of TFT LCD facilitates the team work and group discussion in front of the DSO screen. The bright and colorful display is extremely necessary when dealing with signal analysis and comparison of multiple waveforms shown on the screen at the same time . The TFT Color LCD display of GDS-2000 Series makes the 4 Channel inputs more meaningful.

E. 27 AUTOMATIC MEASUREMENTS

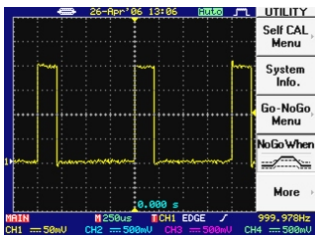


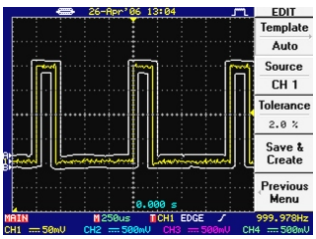


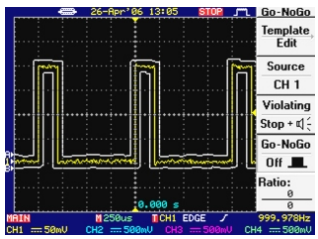


The automatic waveform measurement feature includes 27 frequently used measurement items in three groups: Voltage, Time (Frequency) , and Delay . 10 measurement results maximum with their continuous updates can be shown on the screen menu area simultaneously. A snapshot of all time & voltage related Auto Measurement readings of a designated input signal can be displayed on the screen as a very effective way to get a real-time and overall monitoring on the characteristics of a signal.

F. Go/NoGo TESTING

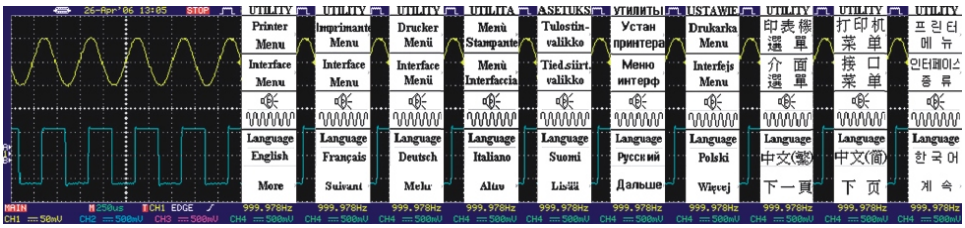


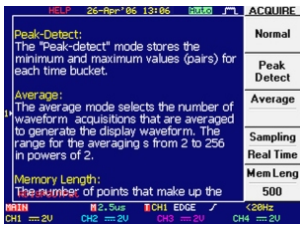




Go/NoGo testing function checks whether the incoming signal violates the user-defined template. Setting the template is simply a two-step process. Pick up the reference waveform from input signal or waveform file and configure the violation tolerance in reference to the waveform, the Go/NoGo testing is ready to go. GDS-2000 Series compares the input signal with template in real time and shows the test result on the screen. Both the type of violation and the DSO reaction toward violation can be selected to meet the requirements of various applications. The violation is indicated either giving a buzzer sound or sending a control signal to the external device via a BNC terminal on the rear of the DSO.

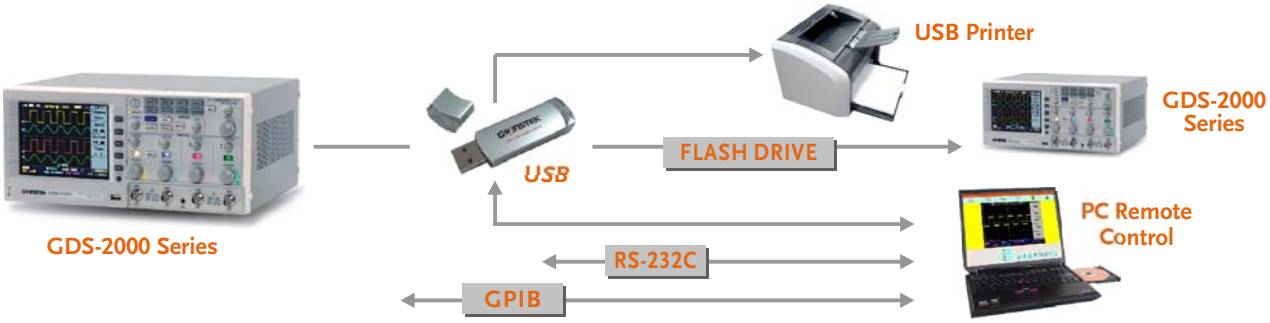
G. ON-LINE HELP AND MULTI-LANGUAGE SUPPORT




HELP
ACQUIRE
Peak-Detect:
The "Peak-detect" mode stores the minimum and maximum values (pairs) for each time bucket.
Average:
The average mode selects the number of waveform acquisitions that are averaged to generate the display waveform. The range for the averaging s from 2 to 256 in powers of 2.
Memory Length:
The number of points that make up the
Normal
Peak Detect
Average
Sampling
Real Time
Mem Leng
500

To provide a friendly operation environment, GDS-2000 Series Offers On-Line Help through the on-screen manual. Press "Help" button to get into the On-Line Help mode, then press any other button to get its instructions on the screen. GDS-2000 Series screen menu and the On-Line Help Manual can be switched among the selections of multiple languages such as English, Traditional Chinese , Simplified Chinese etc . This gives a localized help to the users and offers an easy environment for multicultural joint-projects.

H. DATA STORAGE & TRANSFER AND USB PRINTING SUPPORT



20 sets of waveform data, 20 sets of panel setup and 4 sets of reference waveform data can be saved into GDS-2000 Series internal memory for later recall and display. All the waveform data, panel setup and the screen image can be saved into or recalled from a popular Flash Drive via USB Host Port. With a PC software offered by Good Will Instrument, the GDS-2000 Series waveform data , screen image and the screen record over a period of time can be transferred to the PC for further utilization . GDS-2000 Series offers the USB direct printing support. The color printout of screen image with grayscale can be done via USB connection to a color printer directly.

I. BATTERY POWER OPERATION

Li-Ion Battery Pack

Soft Carrying Case

The battery power operation feature (optional) extends GDS-2000 Series market coverage to the field application areas where AC power is not available. After full charge , the two light-weight battery packs keep GDS-2000 Series running under normal operation for over 3 hours . The built-in battery charger automatically recharges the battery packs whenever the AC power is connected to the oscilloscope. A soft carrying case of GDS-2000 Series is available(optional) to accommodate the field applications.

KEY FEATURES

Summary of features

Rich selections of bandwidth and channel, 200/100/60MHz and 2/4ch, cover major applications in laboratories, production lines, or field services. 1GSa/s high sampling rate and 25k point deep memory give much detailed view into the target waveforms, keeping high sampling rate. USB host and slave connection allows data save and recall, screen image printout, and remote control. TFT color LCD display with wide viewing angle eliminates obscurity in any situation. Battery operation option gives a Much-desired mobility in rapidly changeable environments.

Signal Detection

GDS-2000 Series pick up signals even in the most extreme cases , powered by 1GSa/s real time and 25GSa/s equivalent time sampling rate combined with 3 types of acquisition modes: sample, peak detect, and average. 25k points of deep memory collects more information of a given waveform , guiding us into further signal details . 4 types of flexible triggers add another signal capturing flexibility : edge , video (NTSC , PAL , SECAM) with line selection , pulse-width , and delay/event using external trigger signal (for 2CH models).

Measurement Functions

A variety of measurement shortcuts reduce repetitive manual operations and save your precious time . Autoset automatically configures the horizontal scale , the vertical scale , and the trigger, giving an instant view of almost any signal . 27 types of automatic measurements Include voltage, frequency (time) , and delay . GDS-2000 Series run and update results of all the relevant measurements in real time. You can view the results independently , or together in a single display View . Add and subtract math operation , with 4 types of FFT are also provided : flattop , blackman , hanning , and rectangular . Go/NoGo test function detects a user-defined incoming waveform shape , and can also send asignal to external devices in case of detection . Program and play feature automatically runs predefined sequence and setup , boosting productivity in routine measurements like production line inspection.

Data Transfer and Printout

USB host connector transfers data quickly and easily between USB flash drive, which guarantees almost unlimited amount of memory. Internal storage includes 4 sets of reference waveform and 20 sets of general-use memory area. GDS-2000 Series handle three types of data : display image (*.bmp) for viewing waveform shape and pasting into documents and presentations , panel setting for saving and restoring system setup, and waveform configuration (*.csv) for further analysis of signal information. Printout of display image, color with grayscale, is available through the printer connected to the USB host port. You can set the printout or data saving preference to allow a single-press operation for consecutive works.

Setup Recovery and Transfer

The last panel setting is internally stored in nonvolatile memory , ready to be recovered on the next power up . When the measurement environment frequently changes, or if you want to transfer the setup to another GDS-2000 Series, switching between multiple system settings is done by saving and recalling setup files Using USB flash drive. When the setup gets complicated, you can always recover the default system setting in a simple two-step operation.

Remote Access

IEEE based remote control commands include most of the panel operations and the syntax conforms to universally accepted IEEE 488.2 standard . Proprietary PC software with GUI operation , downloadable from GW Instek website , allows you to use your familiar mouse & keyboard , utilizing the larger PC screen. Three types of remote control interface with flexible connection settings are provided: USB device , RS-232C , and GPIB (optional).

Portability & Friendly User Interface

Battery power operation option with typical 3 hours of running time gives a much-desired mobility . built-in self-calibration and probe compensation help maintaining maximum accuracy even when environment or testing accessories changes . Language support helps you collaborating in multicultural working environments.

SPECIFICATIONS

		GDS-2062/2064	GDS-2102/2104	GDS-2202/2204
VERTICAL	**Channels**	2/4	2/4	2/4
	Bandwidth	DC ~ 60MHz (−3dB)	DC ~ 100MHz (−3dB)	DC ~ 200MHz (−3dB)
	Rise Time	5.8ns Approx.	3.5ns Approx.	1.75ns Approx.
	Sensitivity	2mV/div ~ 5V/div (1-2-5 increments)		
	Accuracy	± (3% x |Readout|+0.05 div x Volts/div+0.8mV)		
	Input Coupling	AC, DC & Ground		
	Input Impedance	1MΩ±2%, ~16pF		
	Polarity	Normal & Invert		
	Maximum Input	300V (DC+AC peak), CATII		
	Waveform Signal Process	+ , − , FFT		
	Offset Range	2mV/div ~ 20mV/div : ±0.5V ; 50mV/div ~ 200mV/div : ±5V ; 500mV/div ~ 2V/div : ±50V ; 5V/div : ±300V		
	Bandwidth Limit	20MHz (−3dB)		
TRIGGER	**Sources**	CH1 , CH2 , Line , EXT for GDS-2062, GDS-2102, GDS-2202 CH1 , CH2 , CH3, CH4, Line for GDS-2064, GDS-2104, GDS-2204		
	Modes	Auto-Level, AUTO, NORMAL, SINGLE, TV, Edge, Pulse Width Time-delay(2CH Only), Event-delay(2CH Only)		
	Coupling	AC , DC , LF rej. , HF rej. , Noise rej.		
	Sensitivity	DC ~ 25MHz : Approx. 0.5div or 5mV 25MHz ~ 60/100/200MHz : Approx. 1div or 10mV		
EXT TRIGGER (2CH Only)	**Range**	±15V		
	Sensitivity	DC ~ 30MHz : ~ 50mV ; 30M ~ 60/100/200MHz : ~100mV		
	Input Impedance	1MΩ ±2% , ~ 16pF		
	Maximum Input	300V (DC＋AC peak) , CATII		
HORIZONTAL	**Range**	1ns/div ~ 10s/div (1-2-5 increments); ROLL : 250ms/div ~ 10s/div		
	Modes	MAIN, WINDOW, WINDOW ZOOM, ROLL, SCAN, X-Y		
	Accuracy	±0.01%		
	Pre-Trigger	20 div maximum		
	Post-Trigger	1000 div		
X-Y MODE	**X-Axis Input**	Channel 1		
	Y-Axis Input	Channel 2		
	Phase Shift	±3°at 100kHz		
SIGNAL ACQUISITION	**Real-Time Sample Rate**	1GSa/s maximum		
	Equivalent Sample Rate	25GSa/s maximum		
	Vertical Resolution	8 Bits		
	Record Length	25K Dots maximum		
	Acquisition Mode	Normal, Peak Detect, Average		
	Peak Detection	10ns		
	Average	2 , 4 , 8 , 16 , 32 , 64 , 128 , 256		
CURSORS AND MEASUREMENT	**Voltage Measurement**	V_{pp} , V_{amp} , V_{avg} , V_{rms} , V_{hi} , V_{lo} , V_{max} , V_{min} , Rise Preshoot/ Overshoot , Fall Preshoot/Overshoot		
	Time Measurement	Freq , Period , Rise Time , Fall Time , Positive Width , Negative Width , Duty Cycle		
	Delay Measurement	Eight different delay measurement		
	Cursors Measurement	Voltage difference between cursors (ΔV) Time difference between cursors (ΔT)		
	Auto Counter	Resolution : 6 digits Accuracy : ±2% Signal Source: All available trigger source except the Video trigger mode		
CONTROL PANEL FUNCTION	**Autoset**	Adjust Vertical VOLT/DIV, Horizontal TIME/DIV, and Trigger level automatically		
	Save Setup	Up to 20 sets of measurement conditions		
	Save Waveform	24 sets of waveform		
DISPLAY	**TFT LCD Type**	5.6 inch		
	Display Resolution	234 (Vertically) x 320 (Horizontally) Dots		
	Display Graticule	8 x 10 divisions ; 8 x 12 divisions (menu off)		
	Display Brightness	Adjustable		
INTERFACE	**Go/NoGo Output**	5V Maximum/10mA TTL Open Collector Output		
	RS-232 Interface	DB 9-pin male DTE RS-232 interface		
	GPIB Interface (Option)	Fully programmable with IEEE 488.2 compliance		
	USB	USB Host/Device 2.0 full speed supported		
POWER SOURCE	**Line Voltage Range**	AC 100V ~ 240V , 48Hz ~ 63Hz , Auto selection		
	Battery Power(Option)	Battery : 11.1V Li-Ion battery pack Charge Time : 8 hours (Power ON) Operating Time : 3 hours , depending on operating condition		
MISCELLANEOUS	**Multi-Language Menu**	Available		
	Online Help	Available		
	Time Clock	Time and Date, Provide the Date/Time for saved data		
DIMENSIONS & WEIGHT	254Dx142Hx310W(mm), Approx. 4.3kg			

Specifications subject to change without notice. DS-2000GD0BH

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